

STATUS REPORT ON THE DEPARTMENT'S REVIEW OF THE PROPOSED CRANDON MINING COMPANY MINE: July 1996

Department of Natural Resources
Box 7921, Madison, WI 53707
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Introduction: The Department continues its detailed review of the proposed underground, zinc-copper-lead mine in Forest County. The project is proposed by the Crandon Mining Company (CMC). During the past six months, Department staff conducted technical meetings with the company to discuss three major issues: the groundwater (flow) modeling effort; the design, operation, and the exact location of the proposed tailings management area; and the nature of the studies conducted to characterize the chemical nature of the wastes (tailings) that the mine would generate. Our review of the proposal will not be final until the Department has received all of the necessary information from the company and until we have completed all of our studies and our impact analyses.

The company's environmental impact report and other documents are available for public review at Department offices in Rhinelander and Madison and in local libraries in Antigo, Green Bay, Crandon, Madison, Milwaukee, Rhinelander, Tomahawk, Washburn and Wausau and also at the University of Wisconsin libraries in Stevens Point and at the UW Engineering Library (Kurt Wendt Library) in Madison. In addition, the same documents have been provided to the affected tribes, federal and state agencies and local municipalities.

Because of the Department's ongoing review of this project, we welcome comments on these materials at any time, although the formal comment period will occur after we release the draft environmental impact statement (EIS).

Groundwater Modeling: There are two major parts to our review of groundwater modeling: review of the flow model (it identifies the rate and direction of groundwater movement and interactions between surface water and groundwater) and review of the contaminant transport models (the movement and concentrations of contaminants as they move into the groundwater from the tailings management area and reflooded mine). A verified flow model is necessary to conduct the contaminant transport modeling. By using the predicted groundwater flow rates and directions from the flow model, the contaminant transport models can assist in our analyses and predict where the contaminants in the groundwater will move, their speed and their concentration.

The Department's consultants are reviewing the company's software and data set for the flow model by running the model on our computers and evaluating the outputs. By running the model, they can verify the usefulness of the data, determine whether it reasonably represents the natural system (its calibration), conduct sensitivity analyses and boundary conditions checks and perform other tests to evaluate the model's predictive capability.

Since the February 1994 Notice of Intent Hearing on the company's proposals, the Department staff and consultants have participated in 28 technical meetings with the company discussing and developing the flow model. As a result of those meetings, the Department staff and consultants have been instrumental in requiring the following changes to the modeling effort:

- The area modeled was expanded northward far beyond Swamp Creek;
- Additional model layers were added beneath the lakes and in the bedrock;
- Model discretization (grid spacing) was increased around the lakes for better resolution;
- The model was made more representative by incorporating the clay layer (saprolite) with another layer above the bedrock;
- Rainfall and snow melt recharge to the aquifer was modified in the model to more closely duplicate field conditions;
- The rate of water movement through the lake beds into the groundwater was set to more accurately reflect the range of actual conditions.

These and other technical changes to the flow model, along with more field data gathered from the project site over the past two years, will help ensure that the model predictions will be the best possible.

We recognize that groundwater modeling is only a predictive tool, and we will require detailed environmental monitoring, including monitoring surface water and groundwater levels and quality, should the project ultimately be approved. Permit conditions would require rerunning the model over regular intervals using the monitoring results as input data. In this manner, the actual impacts occurring in the project area early in the project development could be compared to the predicted impacts in order to check the accuracy of the predictions and to head off any problems that may be developing.

Tailings Disposal: The tailings disposal facility proposed by the company would be very similar in design to a modern engineered landfill. It would have a multiple layer liner system at the base and a drain system above the liner to reduce leakage during operations. To minimize surface water inflow after filling and reclamation, it would have a relatively impermeable reclamation cover. A leachate collection system would allow removal of contaminated water from the disposal cells for treatment at the mine wastewater treatment plant.

Potential for Acidification of Mine Wastes - The potential for the waste materials (the tailings) to form acids, which could result in greater groundwater pollution if uncontrolled, is of considerable concern to the Department. As a result, we have hired three technical consultants to review the work performed by the company and advise us on the technical aspects of mining waste disposal. The company has been conducting waste characterization studies to analyze what would happen to the tailings when exposed in the tailings management area. Recently we identified how the company's waste characterization studies could be improved to identify the worst case conditions that might occur, and the company will be conducting additional studies shortly.

The sulfide wastes in the tailings would begin to oxidize when exposed to air and water. By

covering the tailings after they have settled, water and oxygen input to the tailings would be limited. If oxygen movement into the tailings is reduced, oxidation of the sulfide wastes would be greatly limited. The contrast between uncovered and reclaimed tailings in terms of oxygen availability is dramatic. For example, the surface of uncovered, fresh tailings would be exposed to the atmosphere, which contains approximately 20% free oxygen (equivalent to 200,000 parts per million), while reclaimed tailings beneath soil and multiple liner systems, in contrast, would be exposed to only very small amounts of oxygen (a few parts per million). As a result, if a good reclamation cap were designed and constructed to effectively limit oxygen penetration, oxidation of the wastes would be very limited. Consequently, acid production would be similarly limited.

Because of small amounts of carbonate minerals present in the tailings, any acid that is formed by oxidizing exposed tailings will be initially neutralized by the carbonates. It would take many months for the drainage from the tailings to deplete the available carbonates and for the tailings to become acid. During operations, new layers of tailings would be deposited on top of previously deposited layers so that acid conditions would not form. The design, operation and reclamation of the tailings management area are aimed at preventing acid formation.

Over the long term, acids still could be formed in the waste facility either before complete reclamation could be achieved or following many years of slow oxidation. Therefore, we have asked the company to conduct studies to evaluate how much oxygen could reach the waste mass, to calculate how much oxidation could occur, and to project how much neutralizing potential would be needed in the waste mass to neutralize acids. This type of study will be needed before we could complete our analysis of the proposed tailings management area.

Exact Placement of the Tailings Management Area - DNR staff, in cooperation with the U.S. Army Corps of Engineers, evaluated the placement of the proposed tailings management area with particular emphasis on how it would impact the Bur Oak Swamp to the north. Following our discussions and field inspection of alternative locations and configurations, the company agreed to move the proposed tailings management area several hundred feet further away from the Bur Oak Swamp to reduce potential wetland impacts.

Wastewater Discharge: The Department conducted a public meeting in May to receive comments on the proposed wastewater discharge to the Wisconsin River. A summary of the questions asked at that meeting, along with Department responses, was distributed to the participants early in July. Anyone wishing to receive a copy of the summary can do so by contacting Shannon Fenner in Madison at 267-2770.

Development of GIS for Crandon Project Review: Department staff are initiating the development of a *Geographic Information System (GIS)* to assist in the review of the Crandon project. A GIS enables graphic representation (through maps, tables, etc.) of large volumes of complex information. It also allows people to pose questions of the data in the system, and to produce a map or graphic that can provide answers by showing the physical relationships between various natural resource or human cultural features and characteristics.

The GIS for the proposed Crandon Mine will provide, for example:

- Better graphic representation of groundwater drawdown and resultant surface water impacts;
- The ability to quickly answer landowner questions about possible impacts to private wells;
- An ability to discover places where more data may be needed for an adequate review; and
- The compilation of all data relevant to the project in a single, unified system that will be compatible with many resource analysis models.

Development of this system will take several months, but will be completed in time to be very beneficial in identifying and quantifying expected impacts and in producing the draft EIS.

Crandon Project Schedule: The following schedule is our best estimate for the Department's environmental impact analysis and permit review process. The process may be faster or slower than this schedule shows, depending on resolution of technical questions and changes in the project or regulations pertaining to mining. Preparation of the EIS is not on a fast-track schedule. To review a complex proposal such as this requires sufficient time to complete detailed analyses, and we will not release a draft EIS for public review without complete information.

Remainder of 1996

-Technical meetings with CMC will continue. We should complete our reviews of groundwater flow modeling, contaminant transport modeling, tailings management area design and operation and waste characterization during this period. The Department also must review a surface water mitigation plan that would be implemented to replenish water to any lakes, springs, streams and wetlands that would be predicted to have significant water losses because of the groundwater drawdown.

-Formal DNR review comments on the company's environmental impact report, feasibility report and permit applications should be finalized in this period.

Staff Continues Preparing Draft EIS into First Quarter of 1997

-Prior to the release time for the draft EIS, the Department will develop its proposal for the compliance boundaries and groundwater standards for the proposed mining site. While the maximum compliance boundary is 1,200 feet, it could be proposed for a shorter distance if necessary to protect existing and future groundwater users. Groundwater standards for the expected contaminants from the mining project would be the maximum contaminant levels contained in state and federal drinking water standards unless a more stringent standard is necessary to protect public health, safety and welfare.

First Quarter 1997

-DNR will release the draft EIS and announce the public informational hearing to be held within 30-60 days in the Crandon area. Following receipt of the tribal, public, state and federal agency comments, the Department will revise the draft EIS.

First Half 1997

-The Department will release the final EIS. Preparation for the Master Hearing begins, including production of written testimony, exhibits and draft permits with permit conditions.

120-180 Days after Final EIS Release

-The Master Hearing (a trial-like hearing) on the permit applications, approvals and adequacy of the EIS begins in the project area. The hearing will continue for several weeks or months until the EIS comments and permitting issues have been covered and the public testimony completed.

-After the hearing ends, the briefing period has been completed and the public record closed, the decision-maker has three months to release the written decision on granting or denying permits, on the nature of the permit conditions, and on the impact statement adequacy.

Role of the U.S. Army Corps of Engineers: The U.S. Army Corps of Engineers (COE) is preparing an environmental impact statement on the proposed mining project. The COE will conduct its own groundwater modeling for the Crandon project site in order to evaluate impacts to groundwater and to wetlands. Before construction at the site could begin, the Crandon Mining Company needs to obtain a permit required under the federal Clean Water Act to dredge and fill project site wetlands. The COE also will be reviewing the wetland mitigation proposal by the company to compensate for the loss of project-site wetlands.

Approvals Required from Local Municipalities: Forest County, the City of Crandon, and the towns of Nashville and Lincoln have zoning authority for the proposed mine and must grant the necessary approvals before the project could be built. In addition, Oneida County and the Town of Crescent must approve the proposed wastewater pipeline to the Wisconsin River.

The Crandon Mining Company is negotiating to develop local agreements with Forest County and Lincoln and Nashville Townships. A local agreement is similar to a contract, and would identify the rights, responsibilities and obligations of each of the parties concerning the mining project. Before a municipality could approve a local agreement, it must hold a public hearing, and the approval must take place in a public meeting.

Forest County also owns some of the land in the vicinity of the proposed tailings management area.

The land is designated as county forest land and managed for forestry production. Before this land could be withdrawn from its designation as county forest land, the County Board must approve a resolution to the Department requesting the withdrawal and the Department must approve the withdrawal.

**For Further Information on the Department's Review of the Crandon Project
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